

## PATENT APPLICATION

Navy Case No. 77,897

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application: Imam et al.

Serial No. 08/845,897

Filed: April 28, 1997

For: POROUS MATERIAL/ORGANIC POLYMERIC COMPOSITES

Examiner: Roche

Group Art Unit: 1771

May 15, 2001

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PETITIONS OFFICE

PETITION TO COMMISSIONER UNDER 37 C.F.R. § 1.181  
TO WITHDRAW EXAMINER'S FINAL REJECTION AND EXAMINER'S DECISION  
NOT TO ENTER IN AN ADVISORY ACTION FOR AN AMENDMENT UNDER 37  
C.F.R. § 1.116 SUBMITTED WITH THE SUBSTITUTE APPEAL BRIEF

Honorable Commissioner of Patents  
Washington, D.C. 20231

Sir:

It is respectfully requested that the Commissioner withdraw the Examiner's Final Rejection found in the Office Action mailed on April 19, 2000, and found in the Examiner's Decision in the Advisory Action mailed on March 12, 2001, not to enter the Amendment Under C.F.R. § 1.116 that was filed on February 16, 2001, in conjunction with a Substitute Appeal Brief. It is respectfully requested that the Commissioner enter, in total, an Amendment Under 37 C.F.R. § 1.116.

## STATEMENT OF FACTS

Applicants filed the above-identified patent application on April 28, 1997, containing twenty-two (22) claims.

A First Office Action was mailed on June 1, 1998, requiring Applicants to make an election between claims 5, 6, 8-10 and 12-

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16 to metal species and claims 4, 7, and 11 to polymer species. Applicants' elected with transverse claims 4, 7, and 11 to the polymer species and to generic claims 1-3 and 17-22 in an Amendment filed on August 3, 1998.

In the Second Office Action mailed on September 4, 1998, the Examiner provisionally rejected claims 1,2,4, 7 and 17-22 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-3 and 7-21 of copending Application No. 08/846,192, now U.S. Patent No. 5,895,726. Claim 18 was rejected under 35 U.S.C. § 112, second paragraph. Claims 1-4, 7, 11, 17, 19 and 22 were rejected under 35 U.S.C. § 102(b) as being anticipated by Jarema et al. Claims 18 and 21 were rejected under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over Jarema et al. Claim 20 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Jarema et al.

Applicants filed an Amendment and a Terminal Disclaimer on December 4, 1998. Claims 18 and 22 were amended to overcome the 35 U.S.C. §112, second paragraph rejection. Applicants responded to the 35 U.S.C. § 102(b) and § 103(a) rejections.

In the Third Office Action, Final, mailed on January 16, 1999, the examiner repeated his 35 U.S.C. § 102(b) rejection to claims 1-4, 7, 11, 17, 19 and 22 as being clearly anticipated by Jarema et al. and 103(a) rejection to claims 18 and 21 as anticipated by, or in the alternative, under 35 U.S.C. §102(b) as obvious over Jarema et al. Claim 20 was again rejected under

35 U.S.C. § 103(a) as being unpatentable over Jarema et al.

Applicants filed an Response After Final Rejection on April 15, 1999. No claims were amended.

An Advisory Action was mailed on May 12, 1999, in which it was noted that "Applicant's response to the final rejection, filed on Apr 15, 1999, has been considered with the following effect, but is not deemed to place the application in condition for allowance."

On April 15, 1999, Applicants filed a Supplemental Response After Final Rejection in which applicants cited an Example 9 in Jarema et al.

Applicants filed a Preliminary Amendment on June 14, 1999, in which claims 1, 21 and 22 were amended and a request for a CPA under 37 C.F.R. § 1.53(d).

A Fourth Office Action mailed on August 25, 1999, accepted the CPA and rejected claim 18 under 35 U.S.C. § 112, second paragraph. Claims 1-4, 7, 19 and 22 were rejected under 35 U.S.C. § 102(b) as being anticipated by Fisher et al. Claims 1-4, 7, 11, 19 and 22 were rejected under 35 U.S.C. §102(b) as being anticipated by Tsang et al. Claims 1-4, 7, 19 and 22 were rejected under 35 U.S.C. § 102(b) as being anticipated by or, in the alternative, under 35 U.S.C. § 103 (a) as obvious over Reitz. Claims 17, 18, 20 and 21 were rejected under 35 U.S.C. § 103(a) as being unpatentable over any of Fisher, Tsang, or Reitz.

Applicants filed an Amendment on November 22, 1999, and amended claim 18 and responded to the Fourth Office Action

rejections.

A Fifth Office Action, Final, mailed on April 19, 2000, did not repeat the rejection to claims 1-4, 7, 19, and 22 with regard to the Fisher et al. reference. Claims 1-4, 7, 11, 19 and 22 were rejected under 35 U.S.C. §102(b) as being anticipated by Tsang et al. Claims 1-4, 7, 19 and 22 were rejected under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103 (a) as obvious over Reitz. Claims 17, 18, 20 and 21 were rejected under 35 U.S.C. § 103(a). The Examiner indicated that each of the rejections was the same as the previous rejections.

On July 25, 2000, applicants filed a Notice of Appeal and a Response After Final in which applicants presented their reasons as to why the prior art did not anticipate or make obvious applicants' invention.

An Advisor Action was mailed on August 3, 2000, in which the Examiner stated: "Appellant's response to the final rejection, filed on Jul 25, 2000 has been considered with the following effect, but is not deemed to place the application in condition for allowance."

Applicant filed an Appeal Brief on September 25, 2000.

On November 13, 2000, applicants filed an Amendment. Claims 1-4, 7, 11, 17-22 were amended. A Supplemental Appeal Brief was also filed.

An Advisory Action was mailed on October 18, 2000, requiring a more concise explanation of the claimed invention in the Appeal

Brief.

A Supplemental Appeal Brief and an Amendment were filed on November 13, 2000.

An Advisory Action was mailed on January 1, 2001, indicating that the November 13, 2000, Amendment would not be entered as it "would require further consideration and search, i.e., Class 442." It also required a complete Appeal Brief be filed.

On February 16, 2001, a Substitute Appeal Brief and an Amendment Under 37 C.F.R. § 1.116 were filed.

An Advisory Action was mailed on March 12, 2001, in which the Examiner stated that the Amendment would not be entered as "the newly submitted proposed amendment which changes the term "comprising" to "consisting essentially of" raises a new issue that would require further consideration."

On April 10, 2001, the Examiner's Answer was mailed.

On May 9, 2001, Applicants' attorney spoke with the new Examiner, Examiner Roche, with regard to the Amendment Under 37 C.F.R. § 1.116. Examiner Roche indicated that "consisting essentially of" would require a new search and that this transition language did not remove the ability to have "fillers" in the polymer matrix. Possibly the transition "consisting of" would overcome the Tsang et al. reference. Applicants could file a CPA or a 181 Petition in order for more communication to occur.

In an effort to continue and conclude the prosecution of this application, applicants have decided to file this Petition.

## BACKGROUND

The present invention relates to a composite of a metal foam having pores and a non-elastomeric plastic polymer. The foam has thin ligaments between its pores. Each pore of the metal foam has an outer surface. A plastic polymer fills each of the pores. The plastic polymer would also have an outer surface. The plastic polymer is continuous, i.e., there is only the polymer within each metal foam pore. Thus, there is an interface between the other surface of each filled metal foam pore and the outer surface of the plastic polymer filling that pore.

The polymer is a non-elastomeric material as opposed to being an elastomeric material. Elastomeric is meant to mean that the material has a glass transition temperature at or below room temperature, it is rubbery at room temperature, and it stretches at room temperature. Non-elastomeric is meant to mean that the material has a glass transition temperature above room temperature, it is not rubbery at room temperature and it does not stretch at room temperature.

Sound can be described as energy. When sound waves travel through either the metal foam or the polymer, the energy is transformed at the interface, e.g., sound waves can transform into heat at the interface, and the sound waves are dissipated. The more dissipation of the sound waves the greater the acoustic damping of the material.

The present invention is an acoustic-damping material. The

acoustic damping capabilities of the composite of the present invention arise in part from the acoustic properties of the polymerized resin component and in part from dissipation of energy at the polymer/metal interface. Energy is never transferred without loss at interfaces between different materials. Therefore, as the number of interfaces that an acoustic vibration must transverse increases, the percentage of dissipated acoustic energy also increases. A metal foam/polymer composite provides numerous interfaces between the polymer and the metal matrix.

#### **REMARKS AND ARGUMENTS FOR GRANTING THE RELIEF REQUESTED**

The Examiner, in the Advisory Action mailed on March 12, 2001, stated the Amendment Under 37 C.F.R. § 1.116 would not be entered because: "[t]he newly submitted proposed amendment which changes the term "comprising" to --consisting essentially of-- raises a new issue that would require further consideration." During the telephone interview on May 8, 2001, with Examiner Roche, it was stated that entering the amendment would require a new search.

Entering the Amendment Under 37 C.F.R. § 1.116 would not require a new search and further consideration. MPEP 2111.03 states:

For search and examination purposes, absent a clear indication in the specification of what the basic and novel characteristics actually are, "consisting essentially of" will be construed as equivalent to "comprising."

A search involving the transition word "comprising" has been conducted by the Examiner. There is no need to conduct an additional search but, yes, further consideration would be required of the Examiner.

The Examiner has directed rejections in the Examiner's Answer and Fourth Office Action filed on August 25, 1999, and Advisor Action filed on April 19, 2000, to two (2) references, Reitz and Tsang et al. and the three (3) independent claims, 1, 21 and 22.

In the Amendment Under 37 C.F.R. § 1.116, Applicants' amended claims 1, 21 and 22 to "consisting essentially of."

The transitional phrase "consisting essentially of" limits the scope of a claim to the specified materials or steps "and those that do not materially affect the basic and novel characteristics" of the claimed invention. MPEP 2111.03 and In re Hertz, 190 U.S. P.Q. 461, 463 (CCPA 1976).

Tsang et al. relates to the substitution of asbestos with a friction modifier and a filler in a brake pad. Tsang et al. discloses a slurry made up of a filler, a friction modifier, and a reinforcing fiber carried in a liquid binder solution drawn into the pores of a foam until a desired density is obtained, Col. 1, lines 53-60, and Col. 3, lines 19-33. The friction modifiers disclosed were coke, iron powder, cashew nut powder, zinc, and brass, and the fillers disclosed were barytes, talc and whiting. Fig. 2 discloses coke, rubber and iron powder as a friction modifier and barytes and whiting as fillers. The weight

% of friction modifiers is between 13 and 18% and the weight % of the fillers is between 34 and 50% for a total between 47 and 78 weight %. These two (2) materials are found in all the Examples. Both fillers and friction modifiers are the invention in Tsang et al. and not a curing additive, see Col. 4, lines 21, in which a curing agent was added with the epoxy resin, fillers and friction modifiers.

Applicants' specification, page 8, lines 2-3, discloses the use of a resin component "or may include any catalyst, curing agent, or additives desired." What was meant by "additives desired" was curing additives desired. The Examples 2, 3, 4, 6 used a "curing additive" with the prepolymer synthesized in Example 1. Examples 5, 7, 8, 9, and 10 did not use a curing additive. The curing additive was the only additive added and again it was a "curing additive." This should support that a typographical error occurred and that the word "curing" should be inserted before the word "additive."

A reading of the whole specification will reveal that no friction modifiers or fillers were disclosed. If a friction modifier or filler were used in the invention it would materially affect the basic and novel characteristics of the claimed invention. The plastic polymer is continuous so as not to disrupt the structural integrity of the composite and/or the polymeric component.

Thus, the addition of the filler disclosed in Tsang et al. would materially change the fundamental character of the claimed

invention, In re Herz and Willis, 190 U.S.P.Q. 461, 463 (CCPA 1976). As a search was conducted in which the transition word "comprising" was used as the transition in the claims 1, 21 and 22, there is no need to conduct a further search. As to any Amendment Under 37 C.F.R. § 1.116, the Examiner would have to consider it. If no consideration were the test, than there would be no reason to for the rules to allow these amendments.

As claims 2-4, 7, 11, and 17-20 depend from claim 1 and contain all the limitations of claim 1, it is felt that claims 2-4, 7, 11, and 17-20 would be distinguishable from Tsang et al. in the same manner as claim 1.

Claims 1 and 22 use a "non-elastomeric" polymeric matrix/polymerized resin. Reitz discloses a silicone rubber/rubber that fills the pores of an aluminum-nickel foam, Col. 9, line 66 to Col. 10, line 11. The recitation of "non-elastomer polymeric matrix or non-elastomer polymerized resin" was found in the Preliminary Amendment filed with the CPA on June 14, 1999, and thus, a search was conducted for use of the words "non-elastomeric" and "comprising" with regard to claims 1 and 22. The Examiner is correct with regard to claim 3, applicants inadvertently neglected to delete "hardened natural rubbers, hardened synthetic rubbers" and "hardened silicones" when the Preliminary Amendment was filed. Actually, the applicants should have stated that "silicon rubbers are excluded" or should have inserted the word "plastic" after "hardened." It was applicants' intention to exclude all "elastomeric rubbers" when claims 1 and

22 were amended to "non-elastomeric."

As claims 2-4, 7, 11 and 17-20 depend from claim 1 and contain all the limitations of claim 1, it is felt that claims 2-4, 7, 11, and 17-20 would be distinguishable from Tsang et al. in the same manner as claim 1.

Reitz does not disclose a pore size with regard to claim 21. Reitz only discloses "[h]ousing sheet 61 in this embodiment comprises a porous metal foam such as aluminum-nickel impregnated with rubber, Col. 9, line 66 to Col. 10, line 11." The Examiner admits that Reitz does not specifically disclose the thickness of the metal foam being no less than 3 times the average diameter of the cells, Examiner's Answer, page 4, second full paragraph, and Office Action mailed on August 25, 1999, section 9. The Examiner is stating that:

[I]t would have been obvious to one having ordinary skill in the art at the time the invention was made to have optimized either the thickness of the metal foam or average cell diameter of the metal foam, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 U.S.P.Q. 233. In the present case, it would have been obvious to the skilled artisan to have prepared a thicker metal foam, motivated by the desire to enhance the tensile strength and barrier properties of the metal foam. And, it would have been obvious to the skilled artisan to have

prepared a metal foam having a smaller average cell diameter, motivated by the desire to have optimized the compressive, flexural, shear and tensile strength of the resulting impregnated foam.

The Examiner has enumerated certain properties, i.e., compressive, flexural, shear and tensile strength, which would motivate a skilled artisan. The only desired property by Applicants was "good acoustic damping." Applicants are not sure where the Examiner found the other characteristics that she enumerated.

In the reference cited by the Examiner, In re Aller, 105 U.S.P.Q. 233, 235 (CCPA 1955), the prior art recited the parameters only they were different from those claimed by appellant. In the Reitz reference there is no disclosure of the foam thickness and there is no disclosure of pore size, i.e., no optimum or workable range was recited. The metal foam of Reitz is a housing sheet 61 and it is not an acoustically absorptive material, Col. 10, lines 3-6. The Examiner is not only adding to the prior art disclosure that because there is a metal foam it inherently has pores. Then the Examiner states that "it would have been obvious to one having ordinary skill in the art at the time the invention was made to have optimized either the thickness of the metal foam or the average cell diameter of the metal foam." There is no suggestion, motivation or teaching for an artisan to use Reitz. Reitz could possibly teach away from the present invention as Reitz expressly states that the material

is "not acoustically absorptive." It appears that the Examiner is using hindsight for determining obviousness as well as desired characteristics. Uniroyal v. Rudkin-Wiley, 5 U.S.P.Q.2d 1434, 1438 ( Fed. Cir. 1988).

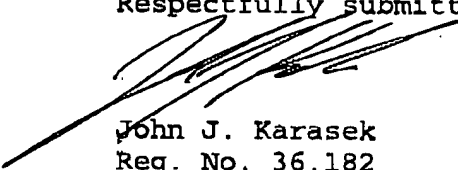
It is Applicants' belief that the Amendment Under 37 C.F.R. § 1.116 does put the application in condition for allowance or, in the alternative, in a better form for appeal.

Applicants have amended claims 1, 21 and 22 to include the transition "comprising essentially of" in the Amendment Under 37 C.F.R. § 1.116 Applicants would like to amended claim 3 to correct the typographical error in the "polyimides" and delete "hardened natural rubbers, hardened synthetic rubbers" and "hardened silicones" as Applicants did neglect to delete these rubbers in their Preliminary Amendment when "non-elastomeric" was inserted in claim 1. Applicants apologize to the Examiner for this confusion. Finally, Applicants would like to amend the specification on page 8, line 3, to insert "curing" before "addition desired" as this omission was a typographical error.

For the foregoing reasons, Applicants respectfully urge that the relief they have requested, the exercise of supervisory authority and the entry of the Amendment Under 37 C.F.R. § 1.116, attached hereto, should be granted as the claims (in addition, would require amendment of claim 3 to delete "hardened natural rubbers, hardened synthetic rubbers" and "hardened silicones" and amendment of the proper spelling of "polyimides") are clearly patentable over the art of record.

Kindly charge and additional fees due, or credit overpayment  
of fees, to Deposit Account 50-0281.

Respectfully submitted,



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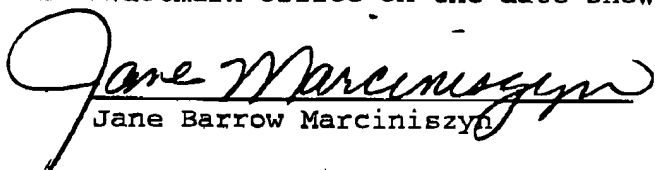
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Date

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Jane Barrow Marciniszyn

**PATENT APPLICATION**

Navy Case No. 77,897

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application of: Iman et al.  
Serial No.: 08/845,897  
Filed: August 28, 1997  
For: POROUS METAL/ORGANIC POLYMERIC COMPOSITES

Examiner: Copenheaver, B.  
Group Art Unit; 1771

February 16, 2001

Honorable Commissioner for Patents  
Washington, D.C. 20231

**AMENDMENT UNDER 37 C.F.R. § 1.116**

Sir:

In response to the Office Action of April 19, 2000, please amend the above-identified application as follows:

**In the claims:**

1. (Twice Amended) An acoustically damping composite article, consisting essentially of a non-elastomeric polymeric matrix having therein a metal foam, said metal foam having an open cell structure, said metal foam being impregnated with said polymer matrix so as to completely penetrate said open cell structure of said foam and fill the cells thereof.
21. (Three Times Amended) An acoustically damping composite article, consisting essentially of a polymeric matrix having therein a metal foam, said metal foam having an open cell structure, said metal foam being impregnated with said polymeric matrix so as to completely penetrate said open cell structure of said foam and fill the cells thereof, and said metal foam thickness no less than 3 times the average diameter of said cells.
22. (Amended) A method of forming a composite consisting essentially of the step of:

impregnating a metal foam, said metal foam having an open cell structure, with a resin component so as to completely penetrate said open cell structure of said foam and fill the open cells of said metal foam with said resin component; and  
converting said resin component, within said cells, to a bulk solid, non-elastomeric polymerized resin, thus forming a composite comprising a matrix of said non-elastomeric polymerized resin, said matrix having therein said metal foam.

**REMARKS**

Reconsideration of the application in view of the above amendments and the following remarks is requested.

Claims 1-22 are now in this case. No claims have been cancelled. Claims 5, 6, 8-10 and 12-16 have been withdrawn from consideration by the examiner, as being directed to a non-elected species. Claims 1, 4, 7, 11 and 17-22 have been amended. No new matter has been added.

Claims 1-4, 7, 11, 19 and 22 have been rejected under 35 U.S.C. § 102(b) as being anticipated by Tsang et al. The patent examiner stated that: "Tsang discloses that suitable binders include epoxy resins and phenolic resins."

Tsang et al. discloses a method of manufacturing a friction article. The method involves a metal foam and a filler, a friction modifier and a reinforcing fiber carried in a liquid binder were drawn into the pores of the open foam structure until a desired density was obtained, Col. 1, lines 53-59. This invention is overcoming a problem in the prior art of the use of the reinforcing fiber "asbestos."

Claims 1 and 22 as amended recite:

1. (Twice Amended) An acoustically damping composite article, consisting essentially of a non-elastomeric polymeric matrix having therein a metal foam, said metal foam having an open cell structure, said metal foam being impregnated with said polymer matrix so as to completely penetrate said open cell structure of said foam and fill the cells thereof.
22. (Amended) A method of forming a composite consisting essentially of the step of: impregnating a metal foam, said metal foam having an open cell structure, with a resin component so as to completely penetrate said open cell structure of said foam and fill the

open cells of said metal foam with said resin component; and  
converting said resin component, within said cells, to a bulk solid, non-elastomeric polymerized resin, thus forming a composite comprising a matrix of said non-elastomeric polymerized resin, said matrix having therein said metal foam.

The Federal Circuit in Constant v. Advanced Micro-Devices Inc., 7 U.S.P.Q.2d 1057, 1064 (Fed. Cir. 1988) stated: "[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." Thus, Tsang et al. does not anticipate claims 1 and 22. There is no disclosure in Tsang et al. with regard to the metal foam being impregnated with said polymer matrix so as to completely penetrate and fill the cells thereof as recited in claims 1 and 22. Claims 1 and 22 do not recite to fillers nor friction modifiers nor reinforcing fiber as is required in Tsang et al.

Claims 2-4, 7, 19 depend from and contain all the limitations of claim 1, it is felt that claims 2-4, 7, 19 distinguish from the reference in the same manner as amended claim 1.

Claims 1-4, 7, 19 and 22 have been rejected under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over Reitz. "Reitz discloses the claimed invention except for literally disclosing that the metal foam is an open celled foam. It appears that the foam must inherently be an open cell foam because the pores of the foam are filled with impregnate, Col. 9, lines 67 to Col. 10, line 11. Reitz also discloses a hardened silicon rubber, which reads on the applicants' definition of a non-elastomeric polymer matrix."

Reitz relates to an acoustic energy absorbing baffle. Housing sheet 61 is a porous metal foam, e.g., aluminum-nickel, impregnated with rubber. It is formed by dipping the metal foam into uncured rubber and then curing the rubber. It is stated at Col. 10, lines 3-4 that: "It is not, in this present embodiment an acoustically absorptive material such as the RTV silicon rubber as taught in U.S. Patent No. 4,528,652."

It is stated at Col. 10, lines 8-9 that: "It [sheet 61] merely serves as an acoustic window for frequencies of acoustic energy (underwater) of 29 kHz and below." This would appear to mean that frequencies of acoustic energy of 29 kHz and below pass through.

It is stated at Col. 10, line 12 that: "Care must be taken to ensure that sheet 61 is watertight." This would appear to mean that it is an elastomer and not "non-elastomer polymer."

Claim 1 has been amended to recite:

(Twice Amended) An acoustically damping composite article, consisting essentially of a non-elastomeric polymeric matrix having therein a metal foam, said metal foam having an open cell structure, said metal foam being impregnated with said polymer matrix so as to completely penetrate said open cell structure of said foam and fill the cells thereof.

Claim 22 has been amended to recite:

(Amended) A method of forming a composite consisting essentially of the step of: impregnating a metal foam, said metal foam having an open cell structure, with a resin component so as to completely penetrate said open cell structure of said foam and fill the open cells of said metal foam with said resin component; and converting said resin component, within said cells, to a bulk solid, non-elastomeric polymerized resin, thus forming a composite comprising a matrix of said non-elastomeric polymerized resin, said matrix having therein said metal foam.

Claims 1 and 22 as amended require that the composition is "acoustically damping" and that the polymer is "non-elastomeric polymer."

The Federal Circuit in Constant v. Advanced Micro-Devices Inc., 7 U.S.P.Q.2d 1057, 1064 (Fed. Cir. 1988) stated: "[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." Thus, Reitz does not anticipate claims 1 and 22. There is not suggestion, or motivation or

teaching in Reitz for use of his invention in the present invention and the problems that it solves with regard to absorbing sound.

Claims 2-4, 7 and 19 depend from claim 1 and contain all the limitations of claim 1 as amended, claims 1-4, 7 and 19 are felt to distinguish from the reference in the same manner as amended claim 1.

Claims 17, 18, 20 and 21 are rejected under 35 U.S.C. §a 103(a) as being unpatentable over either Tsang or Reitz. The patent examiner stated that:

With regard to claim 21, none of Fisher, Tsang and Reitz specifically disclose the pore size relationship of the pores of the metal foam. It would have been obvious to one having skill in the art at the time the invention was made to have optimized either the thickness of the metal foam to average cell diameter of the metal foam, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art.

Fisher relates to the fabrication of shoes and pads for horses. A wire is kinked and then cut into small lengths, e.g., 2.5 cm, to form fibers. These kinked wire fibers are formed into a shape for the horseshoe or pad and by means of a series of rollers then formed into a sheet having a density. The fiber metal structure has voids which are filled with a plastic material, Col. 2, line 56 to Col. 3, line 26. The metal itself is not porous and clearly does not have open cells. "Porous" refers to voids between the individual fiber metal wires.

Tsang et al. discloses a method of manufacturing a friction article. The method involves a metal foam and a filler, a friction modifier and a reinforcing fiber carried in a liquid binder were drawn into the pores of the open foam structure until a desired density was obtained, Col. 1, lines 53-59. There is no disclosure within in this reference with regard to the thickness of the metal foam or to the diameter of the pores/cells. This invention is overcoming a problem in the

prior art of the use of the reinforcing fiber "asbestos."

Reitz discloses an acoustic energy absorbing material and an elastomer.

Reitz relates to an acoustic energy absorbing baffle. Housing sheet 61 is a porous metal foam, e.g., aluminum-nickel, impregnated with rubber. It is formed by dipping the metal foam into uncured rubber and then curing the rubber. It is stated at Col. 10, lines 3-4 that: "It is not, in this present embodiment and acoustically absorptive material such as the RTV silicon rubber as taught in U.S. Patent No. 4,528,652."

It is stated at Col. 10, lines 8-9 that: "It [sheet 61] merely serves as an acoustic window for frequencies of acoustic energy (underwater) of 29 kHz and below." This would appear to mean that frequencies of acoustic energy of 29 kHz and below pass through.

It is stated at Col. 10, line 12 that: "Care must be taken to ensure that sheet 61 is watertight."

Independent claim 21 has been amended to recite:

21. (Three Times Amended) An acoustically damping composite article, consisting essentially of a polymeric matrix having therein a metal foam, said metal foam having an open cell structure, said metal foam being impregnated with said polymeric matrix so as to completely penetrate said open cell structure of said foam and fill the cells thereof, and said metal foam thickness no less than 3 times the average diameter of said cells.

There is no suggestion or teaching with regard to the thickness of the metal foam in any of the cited references. There is no suggestion, teaching or motivation in any of these references to combine these references and there is no relationship between the cited references and the problem being solved in the present application.

The patent examiner cited In re Aller, 105 U.S.P.Q. 233, 235 (CCPA 1955). This reference has no pertinence with regard to the claims in this patent application. In re Aller relates

to a patent application in which the issue related to the patentability of claims in which both the temperature and concentration were changed, i.e., the prior art disclosed a temperature and concentration and the claims in issue changed the ranges. There are no prior conditions disclosed in the cited references so that patentability of amended claim 21 does not involve a change of conditions. In addition, none of these cited references is in the field of the applicants' endeavor or reasonably pertinent to the particular problem with which the inventors were concerned, see In re Oetiker, 24 U.S.P.Q.2d 1443, 1445 (Fed. Cir. 1992).

The test of Section 103 is not whether an improvement or a use set forth in a patent would have been obvious or nonobvious; rather the test is whether the claimed invention, considered as a whole, would have been obvious, Jones v. Hardy, 220 U.S.P.Q. 1021, 1024 (Fed. Cir. 1984). The Federal Circuit in Jones stated:

Though it is proper to note the differences in a claimed invention from the prior art, because that difference may serve as one element in determining the obviousness/nonobviousness issue, it is improper (even if erroneously suggested by a party) to consider the difference as the invention. The "difference" may have seemed slight (as has often been the case with some of history's great inventions, e.g., the telephone), but it may also have been the key to success and advancement in the art resulting from the invention. Further, it is irrelevant in determining obviousness that all or all other aspects of the claim may have been well known in the art. Hence the statute, the law established not judges but by Congress, requires that the invention as claimed be considered "as a whole" when considering whether that invention would have been obvious when it was made. Id. at 1024.

Thus, it is impermissible to focus on the "gist" or "core" of the invention, Bausch & Lomb, Inc. v. Barnes-Hind/Hydrocurve, Inc., 230 U.S.P.Q. 416, 420 (Fed. Cir. 1986), or on

specific differences between the claimed invention and prior art, Jones, at 220 U.S.P.Q. at 1024. Moreover, the invention as a whole is not restricted to the specific subject matter claimed, but also embraces its properties of that structure and the problems which it solves. In re Wright, 6 U.S.P.Q.2d, 1959, 1961 (Fed. Cir. 1988).

Similarly, the references must be taken in their entireties, including those portions which argue against obviousness, Bausch & Lomb, 230 U.S.P.Q. at 420. "It is impermissible within the framework of Section 103 to pick and choose from any one reference only so much of it as will support a given position to the exclusion of other parts necessary to a full appreciation of what such reference fairly suggests to one skilled in the art." Id. at 419. The courts have long cautioned that consideration must be given "where the references diverge and teach away from the claimed invention." Akzo N.V. v. International Trade Commission, 1 U.S.P.Q.2d 1241, 1246 (Fed. Cir. 1986).

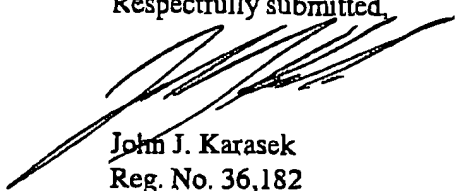
Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned "Version with markings to show changes made."

Kindly charge any additional fees due, or credit any overpayment of fees to Deposit Account 50-0281.

In view of the foregoing, it is submitted that this application is now in condition for

allowance.

Respectfully submitted,

  
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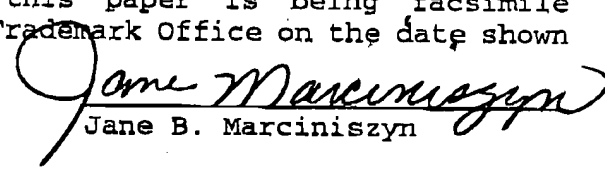
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CERTIFICATE OF FACSIMILE TRANSMISSION

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Jane B. Marciniszyn

**VERSION WITH MARKINGS TO SHOW CHANGES MADE**

**In the claims:**

1. (Twice Amended) An acoustically damping composite article, ~~comprising~~ consisting essentially of a non-elastomeric polymeric matrix having therein a metal foam, said metal foam having an open cell structure, said metal foam being impregnated with said polymer matrix so as to completely penetrate said open cell structure of said foam and fill the cells thereof.
21. (Three Times Amended) An acoustically damping composite article, ~~comprising~~ consisting essentially of a polymeric matrix having therein a metal foam, said metal foam having an open cell structure, said metal foam being impregnated with said polymeric matrix so as to completely penetrate said open cell structure of said foam and fill the cells thereof, and said metal foam thickness no less than 3 times the average diameter of said cells.
22. (Amended) A method of forming a composite ~~comprising~~ consisting essentially of the step of:  
  
impregnating a metal foam, said metal foam having an open cell structure, with a resin component so as to completely penetrate said open cell structure of said foam and fill the open cells of said metal foam with said resin component; and  
  
converting said resin component, within said cells, to a bulk solid, non-elastomeric polymerized resin, thus forming a composite comprising a matrix of said non-elastomeric polymerized resin, said matrix having therein said metal foam.